FACE INVESTIGATION

SUBJECT: Front-end Loader Operator Dies When Loader Falls 40 Feet Onto Quarry Floor

SUMMARY:
A 52-year-old male front-end loader operator (the victim) died after the loader he was driving went off the edge of a 40-foot high access roadway and landed on its side on a stone quarry floor. The loader cab was equipped with a rollover protective structure (ROPS). Operator seatbelts had been installed about five years ago, but it is unknown if the victim was wearing the belt at the time of the incident. The loader had undergone brake and tire repair on the days preceding the incident, and was scheduled for additional brake maintenance. The victim lost control of the empty loader as he was driving from the upper rim of the quarry to the quarry floor where trucks were waiting to be filled with crushed stone. The loader went through a low rock berm guarding the edge of the access road, overturned as it plunged down the quarry wall and landed on its left side. A worker from another company saw the loader falling down the embankment, and ran to the site. He found the victim out of the operator's seat, which was bent forward on its hinges, with his face pushed against the cab frame. The victim was breathing, but unresponsive. Another worker called 911, and EMS workers were at the scene within thirteen minutes. The victim was transported to the hospital, where he was pronounced dead. The FACE investigator concluded that, to prevent similar occurrences, employers should:

! ensure that all frontend loader safety equipment, including brakes, is checked for proper operation before each shift and that malfunctioning equipment is removed from service until it is repaired.

! inspect all equipment used where a potential for rollover exists and ensure that operator seats and seatbelts are adequately secured to the vehicle frame.

! designate a competent person to conduct regular safety inspections.

INTRODUCTION:
On October 6, 1994, a 52-year-old male front-end loader operator died after the loader he was driving went over the edge of a stone quarry access roadway and landed on the quarry floor 40 feet below. The Wisconsin FACE field investigator was notified by the Wisconsin Department of Industry, Labor and Human Relations (DILHR), Workers Compensation Division, on October 31, 1994. On January 30, 1995, the field investigator visited the incident site and met with a company representative. The FACE investigator also obtained incident-site photographs, the death certificate, and reports from MSHA, the medical examiner, Worker's Compensation, DILHR Mine Safety, state climatologist, and the sheriff.

The employer was a sand and gravel company that had been in business about 69 years, with 45 employees. Eight of the workers were front-end loader operators, although the victim was the only company employee who was assigned to the incident site. This incident was the first fatality the company had experienced. The company general manager was the designated safety director, spending about 10% of his time directly in safety-related activities. He also delegated safety duties to another individual who devoted 40% of his time to those activities.

MSHA requirements and recommendations were used as a written safety program, although no written safe work procedures were specific to the victim's job duties. Company supervisors included safety aspects of job duties in weekly jobsite meetings with the workers.
New employees received on-the-job training that included orientation to the jobsite by the supervisor, side-by-side work with an experienced co-worker for 3-5 weeks, a competency checkoff by the co-worker, and the employee's self-evaluation of competency. The victim had worked for the company for about one and a half years, and had worked as a front-end loader operator for about five months. Before starting the new duties, he had received two days of training on front-end loader operation at the worksite where he was assigned.

INVESTIGATION:
For about 20 years, the company had crushed and removed limestone under a sublet agreement with another company that maintained a lease with the quarry owner. The employer had stockpiled crushed rock in the quarry, and assigned the victim to load the rock into customers' trucks using the front-end loader. The piles of crushed rock were stockpiled on the floor of the quarry, while the scales and quarry office were situated on the upper rims. A blacktopped, 22-feet wide, 160-feet long roadway with a 10% grade provided access between the quarry floor and the rim. Berms on both sides of the roadway were composed of boulders and crushed stone, and were about 5 feet wide and from 26-40 inches higher than the roadway.
The diesel-powered loader had been purchased new by the company 20 years before, and was equipped with a ROPS. Operator seatbelts, secured to eye bolts on the sides the seat, had been installed by the company five years before the incident. The seat was fastened to the cab floor with hinges, but lacked tether straps for securing the seat and seatbelts to the cab floor. Company policy required employees to wear seatbelts whenever the loader was in operation, and the victim had been observed wearing the belts during the weeks before the incident.

Company policy also required weekly loader inspections by the operator, with reports of problems going to the mechanic, then to the supervisor after any necessary repairs were completed. The victim was the principal operator of the loader involved in the incident. Inspection reports show that six weeks before the incident the mechanic noted the brakes needed repair. The mechanic performed some repairs onsite at that time, but was unable to free up the two rear brake slack adjusters. Three weeks later, the operator reported the brakes were "not good," and the mechanic indicated new brake shoes were needed. The supervisor drove the loader on level ground to test the brakes, and concluded with the operator that although the loader condition was satisfactory for continued use, it would be sent to the shop for additional brake work when shop space was available. Shop time had been scheduled for the week after the incident. A worker from another company reported at other times he had observed the victim driving the frontend loader at speeds that seemed excessive for the conditions.

On the day of the incident the weather was clear and sunny with no precipitation recorded during the previous week. The company's site supervisor had been at the incident site at 5:00 A.M. on the morning of the incident. He had conducted a general inspection of the site and the company's equipment and stockpiles, and left before the victim arrived for work at 6:30 A.M. The victim was the only company employee working at the site on the day of the incident, however employees of another company that worked the quarry were onsite. The victim loaded customers' trucks until about 9:00 A.M., when he drove the loader from the quarry floor to the rim. Around 9:25 A.M., he was returning to the quarry floor via the access road when the left wheels of the loader

left the paved roadway, and the loader went over the berm and down the 40-foot embankment. An employee of the other company was working near the base of the access road, looked up and saw the loader going over the edge with the front wheels turned right (toward the roadway) and the bucket down. The rate of speed that the loader was traveling was undetermined. The loader landed on its left side and the witness ran to the site. He found the victim out of the operator's seat with his face pushed against the cab frame, and the operator's seat was tipped forward on the hinges. The victim was breathing, but unresponsive. Another worker called 911, and EMS workers were at the scene within thirteen minutes. The victim was transported to the hospital, where he was pronounced dead.

CAUSE OF DEATH: The medical examiner's report listed the cause of death as multiple fractures and internal injuries.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should ensure that all frontend loader safety equipment, including brakes, is checked for proper operation before each shift and that malfunctioning equipment is removed from service until it is repaired.

Discussion: The company policy required weekly inspection reports from loader operators. The operator had reported malfunctioning brakes six weeks and three weeks before the incident, and the mechanic provided onsite repair each time. A pre-shift inspection might have revealed brake problems before they became serious.

Recommendation #2: Employers should inspect all equipment that is used where a potential for rollover exists and ensure that operator seats and seatbelts are adequately secured to the vehicle frame.

Discussion: The seatbelts were connected to eyebolts on the bottom of the seats, which were in turn secured to the loader cab floor with hinges. Manufacturer's requirements that included tethering the seats to the frame were not met in this case. During the incident, the seat tipped forward and the victim was found out of the seat. Tethering the seat as specified by the manufacturer might have maintained the victim in the seat.

Recommendation #3: Employers should designate a competent person to conduct regular safety inspections.

Discussion: Conducting regular safety inspections of all tasks by a competent person[1] will help ensure that

[1]Competent person: One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and

established company safety procedures are being followed. Additionally, scheduled and unscheduled safety inspections of employee work sites clearly demonstrate that the employer is committed to the safety program and to the prevention of occupational injury. In this incident, regular inspections might have detected the inadeqate berm and unscheduled inspections would have given the supervisor an opportunity to observe how the employee was following company policies for seat belt use and proper speed of operation.

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who has the authority to take prompt corrective measures to eliminate them.